LASSI PDR: Software Architecture

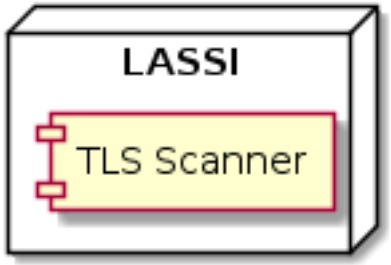
Nathaniel D. Sizemore (nsizemor@nrao.edu)

GREEN BANK OBSERVATORY

September 11, 2019

LASSI

LASSI



Overview

- Methodology
- Requirements
- Current Progress
- LASSI Timing
- Questions

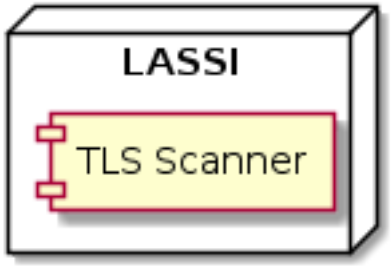
Methodology

- Attribute-Driven Design (ADD)
- Developed by Software Engineering Institute
- The end result: a collection of “views” that communicate the design of the system to whoever needs to know
- Views can be at different scales for different needs: from class definitions up to high level context diagrams

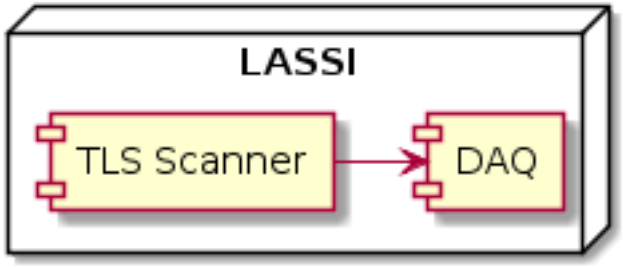
Requirements

- Functional requirements
- Quality requirements
  - Interoperability
  - Accuracy
  - Performance
- Constraints

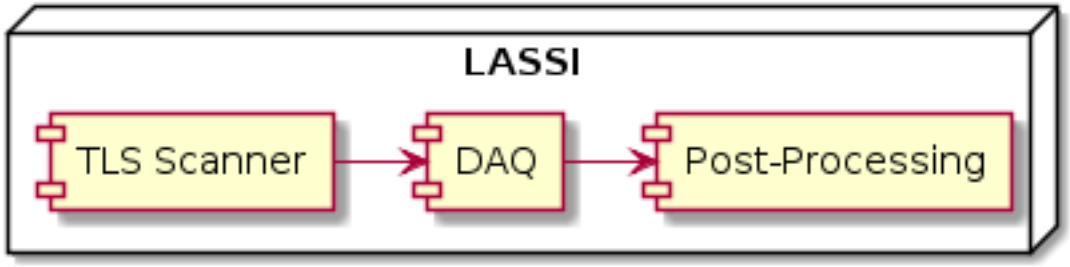
Greenfield Development



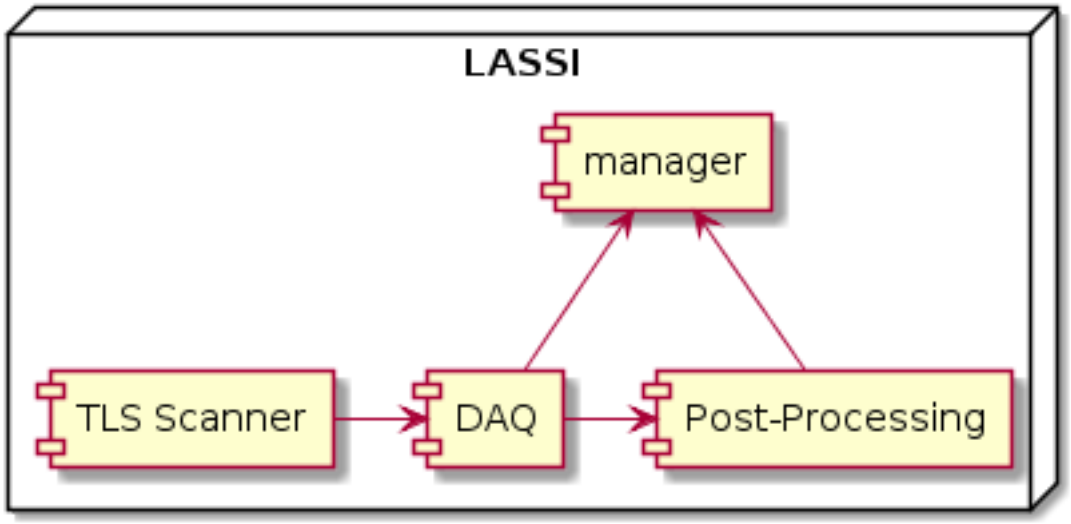
Accuracy



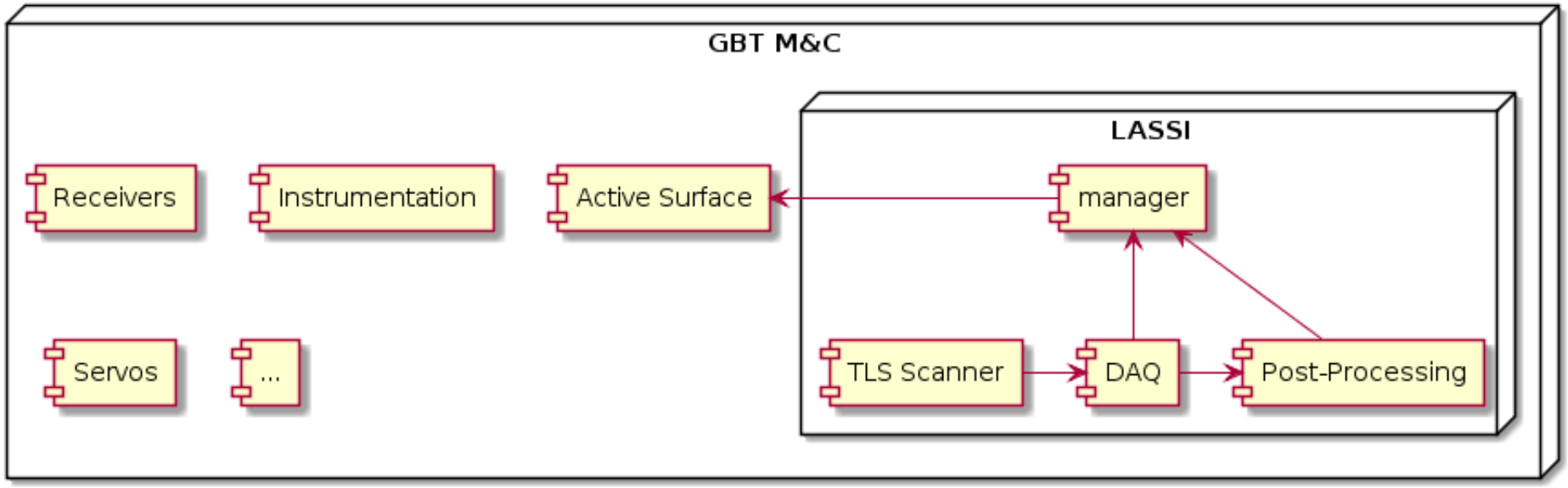
Accuracy, Performance



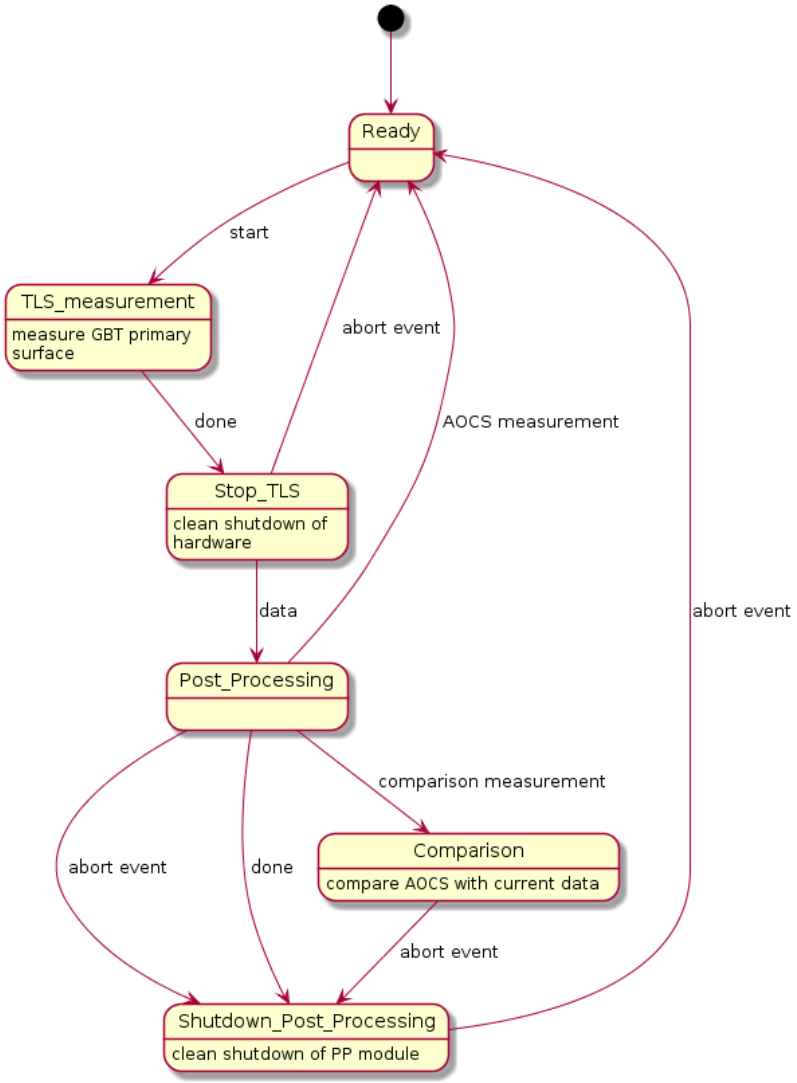
Interoperability



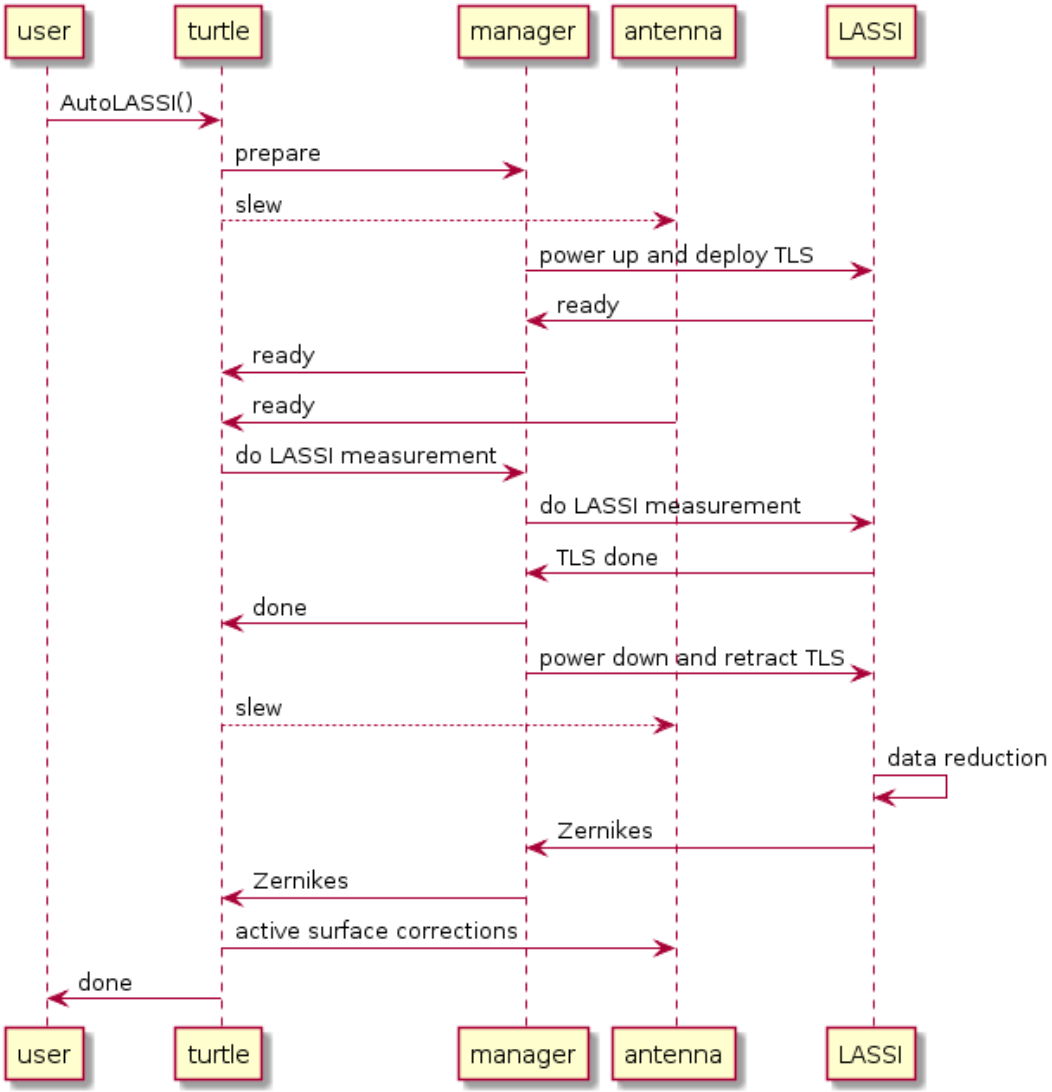
Interoperability



View –State


Ready
start
TLS_measurement
measure GBT primary surface
abort event
done
AOCS measurement
Stop_TLS
clean shutdown of hardware
data
abort event
Post_Processing
comparison measurement
abort event
done
Comparison
compare AOCS with current data
abort event
Shutdown_Post_Processing
clean shutdown of PP module

View – Sequence

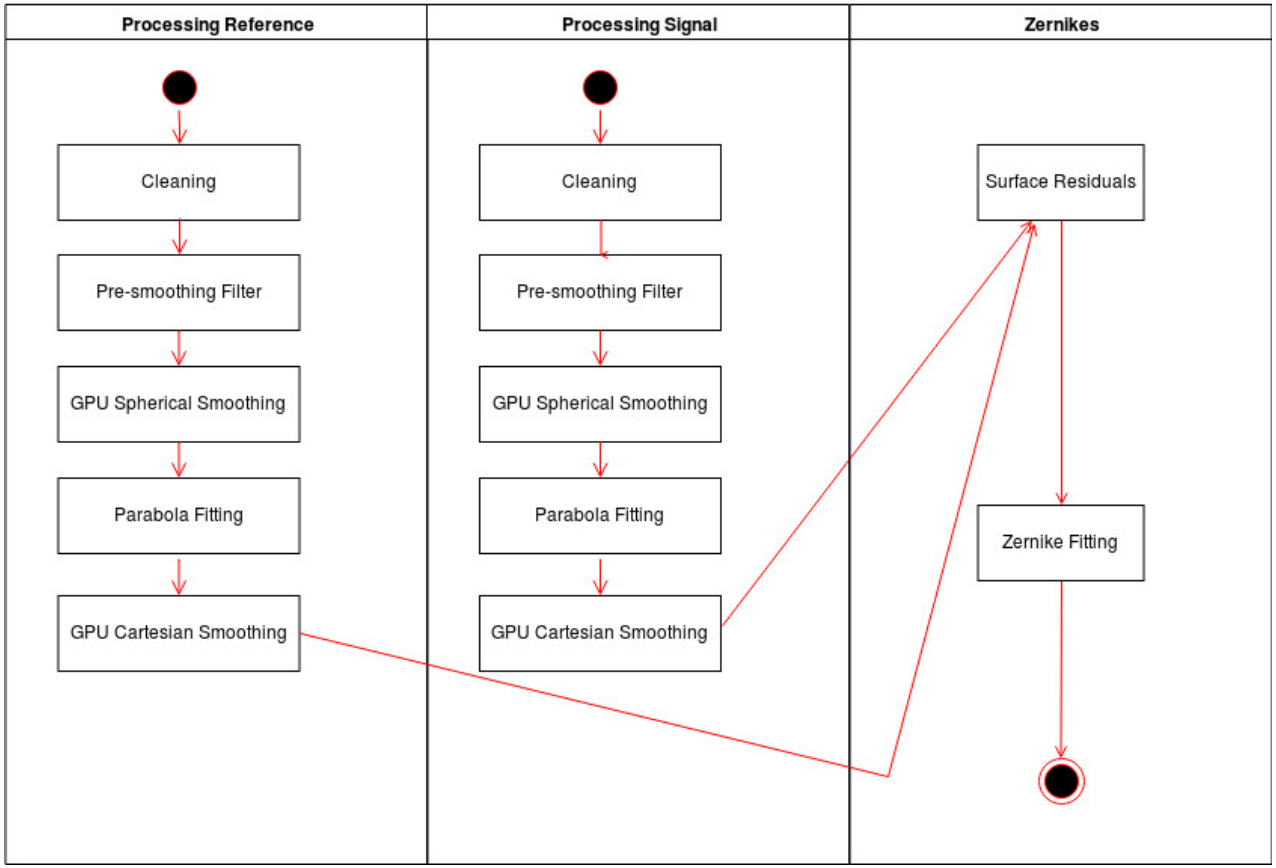


View — Post-Processing

GREEN BANK OBSERVATORY

LASSI Post Processing Architecture

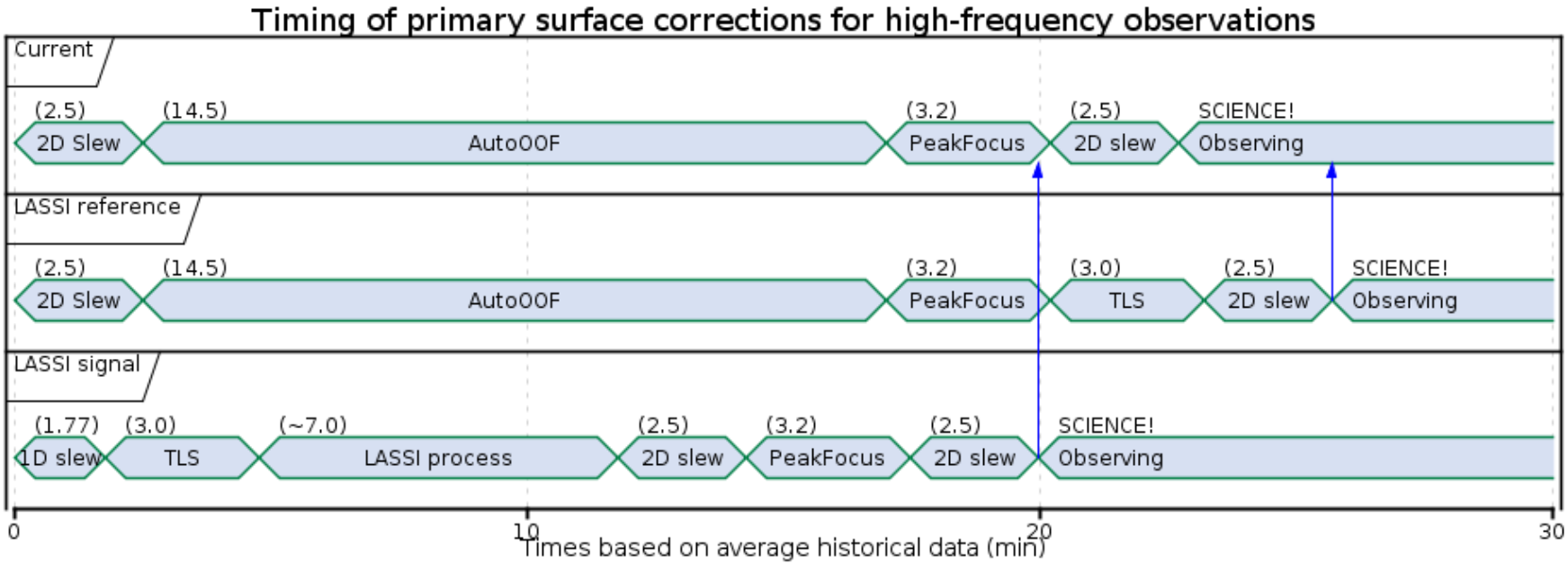
Roughly follows Pipe-and-Filter Reference Architecture. Most pipes are files written to disk so that preliminary stages are saved. Filters labeled 'GPU' actually take place on a separate GPU-enabled host. Each scan can be processed in parallel. Final results are zernikie coefficients describing the difference between our two processed scans (surfaces).



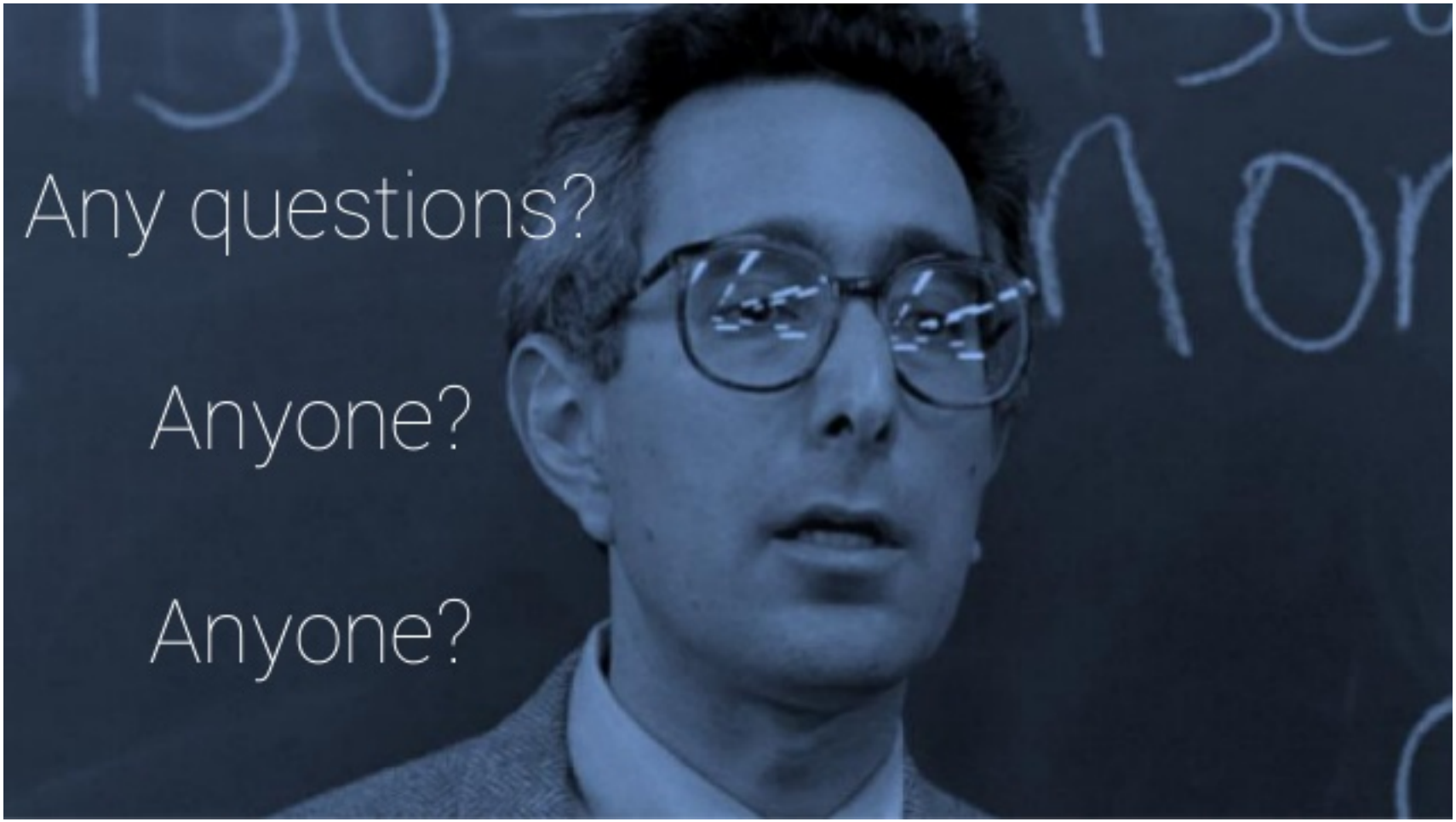
Current Progress

- LASSI DAQ
  - functional, and currently in use
- Post-Processing
  - prototype code, but already working as intended
- Manager
  - TBD — will be similar to many existing managers

LASSI Timing



Questions?



greenbankobservatory.org

"Enhancing GBT Metrology to support high resolution 3mm molecular imaging for the U.S. Community" is supported by the National Science Foundation under Award Number AST-1836009.

The Green Bank Observatory is a facility of the National Science Foundation operated under cooperative agreement by Associated Universities, Inc.